

REMARKS

Claims 1-17 are pending in the present application. Claims 7 and 13 have been indicated as being allowable if rewritten to include the limitations of the claims from which they depend.

Applicants respectfully request reconsideration of the application in view of the remarks appearing below.

Rejection Under 35 U.S.C. § 102(e)

The Examiner has rejected claims 1, 3-6, 8, 9, and 15-17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,023,171 to Boyette, Jr. et al., stating Boyette, Jr. et al. disclose all the elements of these claims. Applicants respectfully disagree.

Boyette, Jr. et al. disclose a dual contact probe tip for performing a conventional Kelvin testing process. The probe tip 10 includes a pair of contacts 12, 14 for contacting a lead 16 that is in electrical communication with a circuit under test 18. To perform a test on circuit under test 18, two probe tips 10 are used to contact two separate leads 16. Probe contacts 12 of the two probe tips 10 are in electrical communication with a driving circuit 20 that applies a driving voltage function to the circuit under test 18 via probe contacts 12. Probe contacts 14 of the two probe tips 10 are in electrical communication with a sensing circuit 22 that "measures the resulting voltage [applied by probe contacts 12] between the two probe contacts 14." Col. 3, lines 42-43 (emphasis added). Sensing circuit 22 is a high impedance circuit so as to minimize the error in the voltage sensed by the sensing circuit due to contact resistance between probe contacts 14 and the respective leads 16. The contamination on each of leads 16 is typically uniform across that lead so that the contact resistance between each probe contact 14 and corresponding lead 16 is substantially, if not entirely, the same as the contact resistance between the corresponding probe contact 12 and that lead.

Sensing circuit 22 is used to determine whether or not circuit under test 18 meets certain pre-established pass/fail criteria. Alternatively, sensing circuit 22 may be used to "correct and control operation of the driving circuit 20" so that the voltage function applied to the circuit under test 18 is a certain magnitude regardless of the magnitude of the contact resistance between probe contacts 12 and the respective leads 16. Col. 3, lines 54-58. As discussed above, sensing circuit 22 measures the voltage between probe contacts 14, i.e., between the two leads 16

of circuit under test 18. Therefore, however driving circuit 20 is controlled, it is controlled by a control signal from sensing circuit 22 that is a function of the voltage between the two leads 16. That is, the control signal of the Boyette, Jr. et al. Kelvin testing apparatus is based upon voltage information acquired from the two leads 16.

The present invention, on the other hand, does not control a driving circuit utilizing a signal based on voltage information from two leads, or two probe pads. Rather, the present invention controls a variable power supply using a signal based on information from only a single probe pad, i.e., the probe pad that is contacted by both a forcing probe and a sensing probe. This is recited, e.g., in independent claims 1 and 9. In each of these claims, a first signal is applied to a probe pad, a second signal is sensed from that same probe pad, and the first signal is adjusted based upon the second signal. In claim 1, the first signal is applied with a forcing probe, the second signal is sensed with a sensing probe, and the first signal is adjusted based on the second signal using a variable power supply.

This is in contradistinction to the system and method of the Boyette, Jr. et al. patent in which a first signal is applied to a probe pad (one of the two leads 16) by a driving probe (a corresponding one of the two probe contacts 12), a second signal is sensed from two probe pads (both of the two leads 16) by sensing circuit 22, and the first signal is varied based upon the second signal. Clearly, Boyette, Jr. et al. do not disclose sensing a second signal from the same probe pad to which a first signal is applied. Rather, Boyette, Jr. et al. disclose sensing a second signal from the two probe pads the two probes 10 are in contact with.

Since the Boyette, Jr. et al. do not disclose at least the feature of independent claims 1 and 9 that a second signal used to control a first signal is sensed from the same probe pad the first signal is applied to, the Boyette, Jr. et al. patent cannot anticipate these claims, nor claims 2-8 and 10-17 that depend therefrom.

In addition, regarding dependent claims 3-6, 8, 16, and 17, Applicants do not agree that the Boyette, Jr. et al. system includes a voltmeter, a probe card, a sensing instrument, and a feedback controller as required by these claims.

For at least the foregoing reasons, Applicants respectfully request that the Examiner withdraw the present anticipation rejection.

Rejection Under 35 U.S.C. § 103

The Examiner has rejected claim 2, 10-12, and 14 under 35 U.S.C. § 103 as being obvious in view of the Boyette, Jr. et al. patent, discussed above, and ordinary skill in the art, stating Boyette, Jr. et al. disclose all of the elements of these claims except a plurality of forcing probes, power supplies, etc., measuring a third electrical signal, and providing feedback controllers. The Examiner then asserts it would have been obvious to a person having ordinary skill in the art to provide these features to the Boyette, Jr. et al. system and method. Applicants respectfully disagree.

Without arguing the merits of each of these rejections, Applicants assert that this rejection is improper because the basic teachings of Boyette, Jr. et al. do not disclose or suggest an important feature of independent claims 1 and 9 from which the rejected claims depend. As discussed above in connection with the anticipation rejection in view of the Boyette, Jr. et al. patent, the Boyette, Jr. et al. system and method do not include the feature of sensing a second signal from the same probe pad that a first signal is applied to. Rather, Boyette, Jr. et al. disclose sensing a second signal from two probe pads. In addition, neither the remaining references of record, nor ordinary skill in the art, disclose or suggest the feature of the present invention of sensing a second signal from the same probe pad that a first signal is applied to. Therefore, any combination of the Boyette, Jr. et al. patent with one or more references of record in view of ordinary skill in the art would lack at least this feature of the rejected claims. Therefore, the present rejection is not proper.

For at least the foregoing reasons, Applicants respectfully request that the Examiner withdraw the present obviousness-type rejections of claims 2, 10-12, and 14.

Other Reference Cited by the Examiner

Applicants have reviewed U.S. Patent No. 6,160,409 to Nurioka cited by the Examiner as being pertinent to Applicants' disclosure. Nurioka discloses, among other things, a probe unit 400W having two probe pins 402a, 402b. Probe unit is designed to be swept across bonding pads 102 for testing microelectronic circuits. The two probe pins 402a, 402b allow easy detection of a specific bonding pad 102 to which a signal is currently being supplied. When both probe pins 402a, 404b are in contact with a bonding pad, a signal TM_{IN} provided by probe pin 402b will be detected via probe pin 402a. This information is then used in the testing

scheme. Nurioka fails to disclose at least controlling a variable power supply using a second signal from a sensing probe in contact with a probe pad so as to control a first signal provided to a forcing probe in contact with that probe pad.

Therefore, any combination of the Nurioka patent with one or more references of record in view of ordinary skill in the art would lack at least this feature of the present invention.

CONCLUSION

In view of the foregoing, Applicants submit that claims 1-17, are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance is respectfully solicited. If any issues remain, the Examiner is encouraged to call the undersigned attorney at the number listed below.

Respectfully submitted,

INTERNATIONAL BUSINESS MACHINES
CORPORATION

By: 

Morgan S. Heller II

Registration No.: 44,756

DOWNS RACHLIN MARTIN PLLC

Tel: (802) 863-2375

Attorneys for Applicants

BTv/238804.1

FAX RECEIVED
APR 08 2003
TECHNOLOGY CENTER 2800